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Award Number: MIPR 1ECCMEM1081

TITLE: Test and Evaluation of a Networked Patient Simulator  
System: Combat Trauma Patient Simulator (CTPS)

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REPORT DATE: January 2002

TYPE OF REPORT: Final

PREPARED FOR: U.S. Army Medical Research and Materiel Command  
Fort Detrick, Maryland 21702-5012

DISTRIBUTION STATEMENT: Approved for Public Release;  
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20020322 055

**REPORT DOCUMENTATION PAGE**Form Approved  
OMB No. 074-0188

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing this collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503

<b>1. AGENCY USE ONLY (Leave blank)</b>		<b>2. REPORT DATE</b> January 2002	<b>3. REPORT TYPE AND DATES COVERED</b> Final (5 Feb 01 - 15 Dec 01)	
<b>4. TITLE AND SUBTITLE</b> Test and Evaluation of a Networked Patient Simulator System: Combat Trauma Patient Simulator (CTPS)			<b>5. FUNDING NUMBERS</b> MIPR 1ECCMEM1081	
<b>6. AUTHOR(S)</b> Jeanette Rasche				
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<b>9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)</b> U.S. Army Medical Research and Materiel Command Fort Detrick, Maryland 21702-5012			<b>10. SPONSORING / MONITORING AGENCY REPORT NUMBER</b>	
<b>11. SUPPLEMENTARY NOTES</b>				
<b>12a. DISTRIBUTION / AVAILABILITY STATEMENT</b> Approved for Public Release; Distribution Unlimited				<b>12b. DISTRIBUTION CODE</b>
<b>13. ABSTRACT (Maximum 200 Words)</b>  Medical readiness training is vital to the US military, since battlefield wounds, such as chemical and biological injuries, are not seen in fixed medical treatment facilities. The Combat Trauma Patient System (CTPS) was designed to simulate combat injuries with a network infrastructure to document medical handling and treatment.  The Combat Trauma Patient Simulation (CTPS) system was developed using congressional funds, by a commercial vendor, Medical Education Technologies Incorporated (METI). This congressionally funded project was managed by two federal agencies, the Simulation, Training and Instrumentation Command (STRICOM) and Telemedicine and Advanced Technology Research Center (TATRC). To date, there have been four congressional awards to the Combat Trauma Patient Simulation (CTPS) project.  The CTPS system will be tested and evaluated in two phases. In the first phase, testing will be conducted to verify system functionality. In this phase the system will be analyzed for usability and to ensure that the system functions according to specifications. In the second phase, assessment and validation of the efficacy of the simulators as training tools will be assessed. In this phase traditional training techniques utilized by the military health care system will be analyzed in contrast with the simulators using a combination of subjective and objective measures.				
<b>14. SUBJECT TERMS</b> Combat Trauma Patient Simulation, system, simulation, Center for Total Access				<b>15. NUMBER OF PAGES</b> 6
				<b>16. PRICE CODE</b>
<b>17. SECURITY CLASSIFICATION OF REPORT</b> Unclassified	<b>18. SECURITY CLASSIFICATION OF THIS PAGE</b> Unclassified	<b>19. SECURITY CLASSIFICATION OF ABSTRACT</b> Unclassified	<b>20. LIMITATION OF ABSTRACT</b> Unlimited	

# Table of Contents

Cover .....	
SF 298 .....	
Introduction .....	2
Body .....	2
Key Research Accomplishments .....	3
Reportable Outcomes .....	3
Conclusions .....	4
References .....	4
Appendices .....	4

# **Test and Evaluation of a Networked Patient Simulator System: Combat Trauma Patient Simulator (CTPS)**

## **Introduction**

Medical readiness training has become vital to the United States military and it has become increasingly more important with the onset of battle wounds, such as chemical and biological injuries, not normally seen in fixed medical treatment facilities. The Combat Trauma Patient Simulator (CTPS) was designed to simulate combat injuries with a network infrastructure to document medical handling and treatment.

The Combat Trauma Patient Simulator (CTPS) system was developed using congressional funds, by a commercial vendor, Medical Education Technologies Incorporated (METI). This congressionally funded effort was managed by Simulation, Training and Instrumentation Command (STRICOM) and Telemedicine and Advanced Technology Research Center (TATRC). The CTPS system is a dual purpose training and analysis simulation system that provides an "end to end" simulation of military casualty handling and treatment.

The Center for Total Access (CTA) will provide an operational test bed for a test and evaluation of the CTPS system. The testing and evaluation will coincide with scheduled medical exercises and will provide opportunities for military medical personnel to practice the individual and collective skills required in a deployed medical environment.

The purpose of conducting an independent test and evaluation of the Combat Trauma Patient Simulation (CTPS) system will provide the military with an objective assessment of the system and its utility and will also evaluate and test traditional training techniques utilized by the military health care system and the impact of technology on training.

## **Body**

The Combat Trauma Patient Simulator (CTPS) system is network of six high fidelity medical simulators and hardware components designed to portray casualty treatment at multiple echelons of care in the battlespace. The CTPS system is designed to be programmed with injuries typically associated with combat. Once a condition has been programmed into the simulator, the mannequin responds to the condition and any healthcare interventions with appropriate physiological responses. The simulator's physiological status and medical interventions are recorded into a centralized database over the network architecture of the CTPS system. The purpose of this test and evaluation is to validate and show an independent and objective assessment of the CTPS system conducted by the Center for Total Access (CTA) at Fort Gordon, Georgia. The purpose of this test is to analyze the functionality of the CTPS system by conducting an

exhaustive usability analysis of the system to verify that the system functions according to specifications, and that it can be efficiently and effectively configured and used by relevant personnel. The evaluation addresses the following areas: installation, vendor education and training, vendor demonstration of system capabilities, vendor documentation, and an independent Evaluation of System Capabilities.

## **Key Research Accomplishments**

- CTPS System Installation at Fort Gordon, July 2001
- CTPS Vendor Demonstration and Training Events, August 2001
- Independent Testing, August – September 2001

## **Reportable Outcomes**

The outcome of the Phase I independent evaluation of the CTPS system are as follows:

**Installation.** The CTPS system was successfully set up over a fourteen-day period. The logistical effort of installing the CTPS system is significant, including occupational health and safety inspections and facility modifications. The layout used in this installation was effective, but a larger space will enhance the utility of the simulators.

**Vendor Education and Training.** Evaluation reports indicate that the training conducted by the vendor met the overall training objectives of the soldiers in setting up and utilizing the CTPS. However, a formal training curriculum will better address the training needs of less technologically advanced soldiers, who received less effective training because of their lack of computer expertise. Trainees requested more time with the CTPS and more repetitions. The development of training aids, including handouts and quick start documentation would enhance the vendor training events.

**Vendor Demonstration of System Capabilities.** Vendor representatives demonstrated features of the CTPS system to CTA staff members. The components evaluated during this demonstration were limited to the casualty handler software, triage controller software interfaces, and the portions of the after action review software. Out of 97 evaluation criteria used during the vendor demonstration, the CTPS system components passed 88 system tests, failed one, and another 8 were not tested due to system errors or inapplicability of the evaluation criteria. Specifically, saving patient scenario physiology causes the system to lock. All other features and capabilities were demonstrated successfully.

**Vendor Documentation.** The documentation provided thus far is informative but not comprehensive. More documentation, specifically a CTPS setup guide and installation protocol with more specificity and a casualty handler user manual and trainee briefing material are needed.

**Independent Evaluation of System Capabilities.** Out of 225 evaluation criteria, 218 passed and seven were not tested due to system errors. Overall, there are a few software bugs, and many procedures can be streamlined, but overall the system works as designed.

## **Conclusions**

The CTPS is a complex system that functions according to specifications and can be configured and used by trainees provided trainees are technologically adept and have some familiarity with computers. The CTPS system provides good utility but requires formal policies, procedures, and documentation. These additional value-added features will enhance the usability of the CTPS system and improve the quality of training provided to soldiers.

## **References**

None available at this time.

## **Appendices**

None available at this time.